

What is claimed is:

Claims

1. An apparatus and method for accelerating a projectile at high speed consisting of:
 - a chamber performing the basic function of a shell casing with a first explosive charge inside at the closed end of the chamber; and
 - a first ignition means for the first explosive charge; and
 - a second explosive charge (additional charges optional) next to the first charge (further from the closed end); and
 - an effectively rigid dividing medium between the two charges; and
 - a projectile next to (closer to the open end) the second (or last) explosive charge; and
 - an ignition means for the second (and any subsequent) explosive charge(s);such that the first explosive charge is ignited by the first ignition means accelerating the yet-unfired second explosive charge (and any subsequent explosive charges each of which is separated from the previous charge by a dividing medium) along with the payload, followed sequentially by the ignition of the second and any subsequent explosive charge(s) each of which provides additive velocity to the projectile.
2. The apparatus and method of claim 1 further comprising:
 - vacuum creation means in advance of the projectile using the explosive force of the ignition(s) themselves or a separate explosion to advance a sealed piston, flange or other airtight form so as to draw a vacuum in a chamber; and
 - a sealed area in advance of the projectile's path for containing a vacuum operatively connected to the vacuum creation means; and
 - a sealed cover for the aforementioned sealed area which is either penetrable, breakable or removable by the advancing projectile such that the explosively created vacuum draws a vacuum from the area in advance of the projectile which reduces air resistance facilitating greater velocity for the projectile which exits through or past the sealed cover.
3. The apparatus and method of claim 1 further comprising:
 - a sealed area in advance of the projectile's path for containing a vacuum;

and

vacuum creation means in advance of the projectile utilizing multiple openings in the sealed area based on the Venturi principle as the entire assembly moves rapidly through the air (as is applicable for a bomb or missile); and

a sealed cover for the aforementioned sealed area in which the vacuum is drawn which is either penetrable, breakable or removable by the advancing projectile or other means such that the vacuum created in the area in advance of the projectile is allowed to accumulate until it is time for the projectile to exit thus reducing air resistance facilitating greater velocity for the projectile which finally exits through or past the sealed cover.

4. The apparatus and method of claim 1 further comprising:

a modified projectile tip with the sharp tip largely flattened so as to be effectively perpendicular to the flight vector creating, as the projectile moves through the air at extremely high air speeds, a partial vacuum around the projectile thus increasing accuracy by reducing the effect of crosswinds while also reducing air drag to increase range.

5. An apparatus and method for accelerating the speed of a projectile in a moving container (such as a Sabot) consisting of:

an apparatus anchored to the muzzle area of the barrel or other well supported foundation to encounter and effectively stop a speeding projectile container (such as a Sabot) as it begins to exit the muzzle with said apparatus having an opening to allow the effectively unrestrained projectile inside the now restrained container to continue in its path past said apparatus; and

a compression chamber within the projectile container with a movable diaphragm or piston in advance of the compression area which will, when encountering the aforementioned container stopping apparatus, remain effectively stationary against it while the inertia of the container along with any expanding gasses behind it will continue moving the container forward causing the now static diaphragm to become closer to the rear of the container thus compressing whatever is in that cavity such as a gas, liquid, slurry, powder or gel; and

a second barrel containing a projectile mounted inside the chamber's compression cavity assembled such that the aforementioned diaphragm allows the advance end of the barrel to go through a movable pressure-sealed hole in the diaphragm as the container moves forward thus allowing the barrel with projectile to move forward through the diaphragm even as the diaphragm becomes closer to the rear of the container such that the

sudden pressure on the diaphragm creates pressure in the compression cavity which, in turn, propels the projectile through the open back end of the barrel adding velocity to the already moving projectile.

6. The apparatus and method of claim 5 further comprising:

an energetic material in the compression chamber of the container; and

timed, sensor initiated, position based, impact initiated (when the container hits the assembly that stops it suddenly even lower grade energetic materials can self-initiate at enhanced detonation rates because of the velocity of the container) or other ignition means causing the contents of the compression chamber to, in addition to the hydraulic compression of claim 4, create additive explosive pressure still further enhanced by the pressure and heat of the high-speed container's impact (both of which accelerate the detonation rate and thus the ability to add velocity) to additively accelerate the projectile.

7. The apparatus and method of claim 5 further comprising:

a sealed area in advance of the projectile's path for containing a vacuum; and

vacuum creation means powered by the same explosion that propels the initial acceleration of the projectile assembly or by other initiated explosion with the resulting expansion of gas occurring in a first chamber equipped with a first sealed plunger or diaphragm which moves in response to the expansion and which is operatively connected (such as by a rod through a seal) to a second sealed plunger or diaphragm in a second chamber such that, as the second plunger or diaphragm moves through the second chamber away from the opening in the second chamber that leads to the area to be evacuated, a vacuum is drawn; and

a sealed cover for the aforementioned sealed area in which the vacuum is drawn which is either penetrable, breakable or removable by the advancing projectile or other means such that the vacuum created in the area in advance of the projectile is allowed to accumulate until it is time for the projectile to exit thus reducing air resistance facilitating greater velocity for the projectile which finally exits through or past the sealed cover.

8. An apparatus and method for accelerating the speed of a projectile in a moving container (such as a Sabot) consisting of:

an apparatus just past the projectile's point of exit anchored to the barrel

or other well supported foundation to encounter and effectively stop a speeding projectile container (such as a Sabot) as it exits the opening with said apparatus having an opening to allow the effectively unrestrained projectile inside the now restrained container to continue in its path past said apparatus; and

a lever, gear, pulley or similar leveraging assembly operatively connected to the above braking mechanism so that the force of the impact is passed on to the back of the projectile and impacts it, through a swinging contact arm or other force transmission mechanism, with the leverage gained such that the contact arm or other transmission mechanism is moving significantly faster than the projectile thus further increasing the velocity of the projectile thus converting the normally wasted momentum of the heavy discardable Sabot and the ordinarily wasted force of the remaining gasses (which, at point of exit, are normally moving too slowly to do any more good) into increased velocity.

9. An apparatus and method for increasing the rate of oxidation of charges made up of energetic materials consisting of:

multiple bridgewires or other ignition mechanisms arrayed in the explosive designed to all initiate at effectively the same point in time so that the time required for full release of energy is limited only by the distance between the furthest 2 ignition points (very short) as opposed to the longest distance across the entire explosive thus effectively releasing more energy in less time and thereby increasing the potential speed of any motion effecting work done such as the acceleration of a projectile.